

**ANALYTICAL RESULTS**

Prepared for:

SUN: Aquaterra Tech.  
PO Box 744  
West Chester PA 19381

610-431-5733

Prepared by:

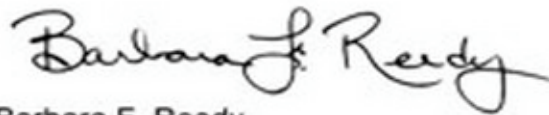
Lancaster Laboratories  
2425 New Holland Pike  
Lancaster, PA 17605-2425**SAMPLE GROUP**

The sample group for this submittal is 1001363. Samples arrived at the laboratory on Friday, August 11, 2006. The PO# for this group is SUNOCO PHILLY REFINER.

**Client Description**B162-081006 Grab Water Sample  
B116-081006 Grab Water Sample**Lancaster Labs Number**4840111  
4840112ELECTRONIC      SUN: Aquaterra Tech.  
COPY TO  
ELECTRONIC      Langan  
COPY TO  
ELECTRONIC      Langan  
COPY TO  
ELECTRONIC      Langan  
COPY TOAttn: Brad Spancake  
  
Attn: Jason Hanna  
  
Attn: Joseph Catricks  
  
Attn: Dennis Webster

Questions? Contact your Client Services Representative  
Rebecca J Shettel at (717) 656-2300

Respectfully Submitted,



Barbara F. Reedy  
Senior Specialist



# Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Page 1 of 2

Lancaster Laboratories Sample No. WW 4840111

B162-081006 Grab Water Sample  
SUN: Philadelphia Refinery AOI-6

Collected: 08/10/2006 09:45 by MBS

Account Number: 10132

Submitted: 08/11/2006 17:15  
Reported: 08/21/2006 at 08:37  
Discard: 09/21/2006

SUN: Aquaterra Tech.  
PO Box 744  
West Chester PA 19381

B1628

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Units	Dilution Factor
06035	Lead	7439-92-1	< 0.0010	0.0010	0.000047	mg/l	1
07879	EDB in Wastewater						
01087	Ethylene dibromide	106-93-4	< 0.028	0.028	0.0094	ug/l	1
07805	PAHs in Water by GC/MS						
03947	Naphthalene	91-20-3	< 5.	5.	1.	ug/l	1
03956	Fluorene	86-73-7	< 5.	5.	1.	ug/l	1
03963	Phenanthrene	85-01-8	< 5.	5.	1.	ug/l	1
03967	Pyrene	129-00-0	< 5.	5.	1.	ug/l	1
03971	Chrysene	218-01-9	< 5.	5.	1.	ug/l	1
02302	UST-Waters by 8260B						
02010	Methyl Tertiary Butyl Ether	1634-04-4	< 25.	25.	3.	ug/l	5
05401	Benzene	71-43-2	< 25.	25.	3.	ug/l	5
05402	1,2-Dichloroethane	107-06-2	< 25.	25.	5.	ug/l	5
05407	Toluene	108-88-3	< 25.	25.	4.	ug/l	5
05415	Ethylbenzene	100-41-4	< 25.	25.	4.	ug/l	5
05420	Isopropylbenzene	98-82-8	< 25.	25.	5.	ug/l	5
06310	Xylene (Total)	1330-20-7	< 25.	25.	4.	ug/l	5

The reporting limits for the GC/MS volatile compounds were raised due to sample foaming.

Commonwealth of Pennsylvania Lab Certification No. 36-037

This sample was filtered in the lab for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
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\*=This limit was used in the evaluation of the final result



# Analysis Report

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PO Box 744

Discard: 09/21/2006

West Chester PA 19381

B1628

06035	Lead	SW-846 6020	1	08/17/2006 22:36	John P Hook	1
07879	EDB in Wastewater	SW-846 8011	1	08/15/2006 16:19	Richard A Shober	1
07805	PAHs in Water by GC/MS	SW-846 8270C	1	08/17/2006 22:18	William T Parker	1
02302	UST-Waters by 8260B	SW-846 8260B	1	08/14/2006 21:37	Lauren C Marzario	5
01163	GC/MS VOA Water Prep	SW-846 5030B	1	08/14/2006 21:37	Lauren C Marzario	5
06050	ICP/MS SW-846 Water	SW-846 3010A modified	1	08/15/2006 09:50	Megersa Deyessa	1
07786	EDB Extraction	SW-846 8011	1	08/14/2006 19:45	Kerrie A Greenfield	1
07807	BNA Water Extraction	SW-846 3510C	1	08/13/2006 07:45	Joseph S Feister	1

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# Analysis Report

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Lancaster Laboratories Sample No. WW 4840112

B116-081006 Grab Water Sample  
SUN: Philadelphia Refinery AOI-6

Collected: 08/10/2006 10:00 by MBS

Account Number: 10132

Submitted: 08/11/2006 17:15  
Reported: 08/21/2006 at 08:37  
Discard: 09/21/2006

SUN: Aquaterra Tech.  
PO Box 744  
West Chester PA 19381

B1168

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Units	Dilution Factor
06035	Lead	7439-92-1	< 0.0010	0.0010	0.000047	mg/l	1
07879	EDB in Wastewater						
01087	Ethylene dibromide	106-93-4	< 0.029	0.029	0.0096	ug/l	1
07805	PAHs in Water by GC/MS						
03947	Naphthalene	91-20-3	< 5.	5.	1.	ug/l	1
03956	Fluorene	86-73-7	< 5.	5.	1.	ug/l	1
03963	Phenanthrene	85-01-8	< 5.	5.	1.	ug/l	1
03967	Pyrene	129-00-0	< 5.	5.	1.	ug/l	1
03971	Chrysene	218-01-9	< 5.	5.	1.	ug/l	1
02302	UST-Waters by 8260B						
02010	Methyl Tertiary Butyl Ether	1634-04-4	< 5.	5.	0.5	ug/l	1
05401	Benzene	71-43-2	< 5.	5.	0.5	ug/l	1
05402	1,2-Dichloroethane	107-06-2	< 5.	5.	1.	ug/l	1
05407	Toluene	108-88-3	< 5.	5.	0.7	ug/l	1
05415	Ethylbenzene	100-41-4	< 5.	5.	0.8	ug/l	1
05420	Isopropylbenzene	98-82-8	< 5.	5.	1.	ug/l	1
06310	Xylene (Total)	1330-20-7	< 5.	5.	0.8	ug/l	1

Commonwealth of Pennsylvania Lab Certification No. 36-037

This sample was filtered in the lab for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	08/17/2006 22:39	John P Hook	1
07879	EDB in Wastewater	SW-846 8011	1	08/15/2006 16:50	Richard A Shober	1
07805	PAHs in Water by GC/MS	SW-846 8270C	1	08/17/2006 22:41	William T Parker	1

\*=This limit was used in the evaluation of the final result



# Analysis Report

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Page 2 of 2

Lancaster Laboratories Sample No. WW 4840112

B116-081006 Grab Water Sample

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Collected: 08/10/2006 10:00 by MBS

Account Number: 10132

Submitted: 08/11/2006 17:15

SUN: Aquaterra Tech.

Reported: 08/21/2006 at 08:37

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Discard: 09/21/2006

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B1168

02302	UST-Waters by 8260B	SW-846 8260B	1	08/14/2006 22:00	Lauren C Marzario	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	08/14/2006 22:00	Lauren C Marzario	1
06050	ICP/MS SW-846 Water	SW-846 3010A modified	1	08/15/2006 09:50	Megersa Deyessa	1
07786	EDB Extraction	SW-846 8011	1	08/14/2006 19:45	Kerrie A Greenfield	1
07807	BNA Water Extraction	SW-846 3510C	1	08/13/2006 07:45	Joseph S Feister	1

\*=This limit was used in the evaluation of the final result

## Quality Control Summary

Client Name: SUN: Aquaterra Tech.  
Reported: 08/21/06 at 08:37 AM

Group Number: 1001363

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

## Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank LOQ**	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 06224WAC026	Sample number(s): 4840111-4840112								
Naphthalene	< 5.	5.	1.	ug/l	84	77	68-108	8	30
Fluorene	< 5.	5.	1.	ug/l	94	84	75-111	11	30
Phenanthrene	< 5.	5.	1.	ug/l	95	88	68-111	7	30
Pyrene	< 5.	5.	1.	ug/l	93	87	68-114	7	30
Chrysene	< 5.	5.	1.	ug/l	89	86	70-111	3	30
Batch number: 062260007A	Sample number(s): 4840111-4840112								
Ethylene dibromide	< 0.030	0.030	0.010	ug/l	108	113	60-140	4	20
Batch number: 062276050002A	Sample number(s): 4840111-4840112								
Lead	< 0.0010	0.0010	0.00004	mg/l	102		86-115		
			7						
Batch number: T062262AA	Sample number(s): 4840111-4840112								
Methyl Tertiary Butyl Ether	< 5.	5.	0.5	ug/l	109		73-119		
Benzene	< 5.	5.	0.5	ug/l	111		85-117		
1,2-Dichloroethane	< 5.	5.	1.	ug/l	118		77-132		
Toluene	< 5.	5.	0.7	ug/l	96		85-115		
Ethylbenzene	< 5.	5.	0.8	ug/l	91		82-119		
Isopropylbenzene	< 5.	5.	1.	ug/l	94		80-120		
Xylene (Total)	< 5.	5.	0.8	ug/l	94		83-113		

## Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	BKG MAX	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 062260007A	Sample number(s): 4840111-4840112 UNSPK: P840118 BKG: P840119							
Ethylene dibromide	48*		65-135		< 0.029	< 0.029	0 (1)	30
Batch number: 062276050002A	Sample number(s): 4840111-4840112 UNSPK: P839507 BKG: P839507							
Lead	102	101	78-120	1	20	0.0037	0.0040	6 (1)
Batch number: T062262AA	Sample number(s): 4840111-4840112 UNSPK: P837767							
Methyl Tertiary Butyl Ether	101	103	69-127	2	30			
Benzene	113	112	83-128	1	30			
1,2-Dichloroethane	118	117	70-143	1	30			
Toluene	106	106	83-127	1	30			
Ethylbenzene	101	99	82-129	2	30			
Isopropylbenzene	103	104	81-130	1	30			
Xylene (Total)	102	103	82-130	1	30			

\*- Outside of specification

\*\* This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The background result was more than four times the spike added.

## Quality Control Summary

Client Name: SUN: Aquaterra Tech.  
Reported: 08/21/06 at 08:37 AM

Group Number: 1001363

### Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike  
Background (BKG) = the sample used in conjunction with the duplicate

	MS	MSD	MS/MSD	RPD	BKG	DUP	DUP	Dup
<u>Analysis Name</u>	<u>%REC</u>	<u>%REC</u>	<u>Limits</u>	<u>RPD</u>	<u>MAX</u>	<u>Conc</u>	<u>Conc</u>	<u>RPD</u>
								<u>Max</u>

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: PAHs in Water by GC/MS  
Batch number: 06224WAC026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
4840111	92	91	92
4840112	90	89	89
Blank	94	92	99
LCS	91	92	96
LCSD	84	84	88
Limits:	51-123	64-112	52-151

Analysis Name: EDB in Wastewater  
Batch number: 062260007A  
1,1,2,2-Tetrachloroethane

4840111	67
4840112	72
Blank	102
DUP	57
LCS	112
LCSD	113
MS	44*
Limits:	52-120

Analysis Name: UST-Waters by 8260B

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
4840111	93	82	87	89
4840112	94	85	87	90
Blank	94	85	84	90
LCS	92	84	87	95
MS	90	85	90	92
MSD	91	86	91	93
Limits:	80-116	77-113	80-113	78-113

\*- Outside of specification

\*\* This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The background result was more than four times the spike added.



# Analysis Request/ Environmental Services Chain of Custody



For Lancaster Laboratories use only  
 Acct. # 10132 Group# 1001363 Sample # 4840111-12

**COC #** 0133945

Please print. Instructions on reverse side correspond with circled numbers.

1.9-4.0°C

<b>1</b> Client: <u>Sun Aquaterra / Langan</u> Acct. #: _____ Project Name/##: <u>Sun-Philadelphia Refinery AOT-6</u> PWSID #: _____ Project Manager: <u>B. Spence / J. Hanne</u> P.O. #: _____ Sampler: <u>M. B. Spence</u> Quote #: _____ Name of state where samples were collected: <u>PA</u>				<b>4</b> Matrix Soil <input type="checkbox"/> Water <input type="checkbox"/> Other <input type="checkbox"/> Total # of Containers: _____ 8200B BTEX, MBE, Cumene, EDC 8011 EDB 1020 Diss. Pb 8270C Chlorine, Naphthalene, Pyrene Phenanthrene				<b>5</b> Analysis Requested Preservation Codes H=HCl T=Thiosulfate N=HNO <sub>3</sub> B=NaOH S=H <sub>2</sub> SO <sub>4</sub> O=Other				<b>6</b> For Lab Use Only FSC: _____ SCR#: <u>31864</u> Preservation Codes H=HCl T=Thiosulfate N=HNO <sub>3</sub> B=NaOH S=H <sub>2</sub> SO <sub>4</sub> O=Other Remarks: _____ Temperature of samples (upon receipt if requested)			
<b>2</b> Sample Identification				<b>3</b> Date Collected Time Collected		Grab Composite		Soil Water Other		Total # of Containers		Remarks			
B162-081006				8/10/06		0945		X		X		8		Dissolved Pb samples are unfiltered/unpreserved  Please provide Equis EDB	
B116-081006				8/10/06		1000		X		X		8			
<b>7</b> Turnaround Time Requested (TAT) (please circle): Normal <u>Rush</u> (Rush TAT is subject to Lancaster Laboratories approval and surcharge.) Date results are needed: <u>8/18/06</u> Rush results requested by (please circle): Phone Fax E-mail Phone #: _____ Fax #: _____ E-mail address: _____															
<b>8</b> Data Package Options (please circle if required) Type I (validation/NJ Reg) TX TRRP-13 Type II (Tier II) MA MCP CT RCP Type III (Reduced NJ) Site-specific QC (MS/MSD/Dup)? Yes <u>No</u> Type IV (CLP SOW) (If yes, indicate QC sample and submit triplicate volume.) Type VI (Raw Data Only) Internal COC Required? Yes <u>No</u>															
Relinquished by: <u>Bottle Storage</u> Date: <u>8/9/06</u> Time: <u>7:00</u>				Received by: <u>Marnie McHallen</u> Date: <u>8/9/06</u> Time: <u>7:00</u>				<b>9</b>							
Relinquished by: <u>Marnie McHallen</u> Date: <u>8/9/06</u> Time: <u>9:30</u>				Received by: <u>Aquaterra</u> Date: <u>8/9/06</u> Time: <u>0930</u>											
Relinquished by: <u>M. B. Spence</u> Date: <u>8/10/06</u> Time: <u>1630</u>				Received by: <u>Aquaterra Fridge</u> Date: <u>8/10/06</u> Time: <u>1630</u>											
Relinquished by: <u>[Signature]</u> Date: <u>8/11/06</u> Time: <u>15:20</u>				Received by: <u>[Signature]</u> Date: <u>8/11/06</u> Time: <u>10:20</u>											
Relinquished by: <u>[Signature]</u> Date: <u>8/11/06</u> Time: <u>17:15</u>				Received by: <u>[Signature]</u> Date: <u>8/11/06</u> Time: <u>17:15</u>											

## Lancaster Laboratories

### Explanation of Symbols and Abbreviations

*The following defines common symbols and abbreviations used in reporting technical data:*

<b>N.D.</b>	none detected	<b>BMQL</b>	Below Minimum Quantitation Level
<b>TNTC</b>	Too Numerous To Count	<b>MPN</b>	Most Probable Number
<b>IU</b>	International Units	<b>CP Units</b>	cobalt-chloroplatinate units
<b>umhos/cm</b>	micromhos/cm	<b>NTU</b>	nephelometric turbidity units
<b>C</b>	degrees Celsius	<b>F</b>	degrees Fahrenheit
<b>Cal</b>	(diet) calories	<b>lb.</b>	pound(s)
<b>meq</b>	milliequivalents	<b>kg</b>	kilogram(s)
<b>g</b>	gram(s)	<b>mg</b>	milligram(s)
<b>ug</b>	microgram(s)	<b>l</b>	liter(s)
<b>ml</b>	milliliter(s)	<b>ul</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>fib &gt;5 um/ml</b>	fibers greater than 5 microns in length per ml
<b>&lt;</b>	less than – The number following the sign is the <u>limit of quantitation</u> , the smallest amount of analyte which can be reliably determined using this specific test.		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million – One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture.		

*U.S. EPA data qualifiers:*

#### Organic Qualifiers

<b>A</b>	TIC is a possible aldol-condensation product
<b>B</b>	Analyte was also detected in the blank
<b>C</b>	Pesticide result confirmed by GC/MS
<b>D</b>	Compound quantitated on a diluted sample
<b>E</b>	Concentration exceeds the calibration range of the instrument
<b>J</b>	Estimated value
<b>N</b>	Presumptive evidence of a compound (TICs only)
<b>P</b>	Concentration difference between primary and confirmation columns >25%
<b>U</b>	Compound was not detected
<b>X,Y,Z</b>	Defined in case narrative

#### Inorganic Qualifiers

<b>B</b>	Value is <CRDL, but ≥IDL
<b>E</b>	Estimated due to interference
<b>M</b>	Duplicate injection precision not met
<b>N</b>	Spike amount not within control limits
<b>S</b>	Method of standard additions (MSA) used for calculation
<b>U</b>	Compound was not detected
<b>W</b>	Post digestion spike out of control limits
<b>*</b>	Duplicate analysis not within control limits
<b>+</b>	Correlation coefficient for MSA <0.995

Analytical test results for methods listed on the laboratories' accreditation scope meet all requirements of NELAC unless otherwise noted under the individual analysis.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

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